

REMARKS

This Amendment is filed in response to the Office Action dated August 9, 2007 and the telephone interview with Examiner Sheehan on November 2, 2007. For the following reasons this application should be allowed and the case passed to issue. No new matter is introduced by this amendment. New claim 21 is supported by prior claim 10, and the specification, which clearly discloses that the magnet alloy powder exhibits an anisotropic property.

Claims 1, 3, 4, 6-9, and 11-21 are pending in this application. Claims 12-19 are withdrawn from consideration, pursuant to a restriction requirement. Claims 1, 3, 4, 6-11 and 20 have been rejected. Claim 10 has been canceled in this response. Claims 2 and 5 were previously canceled. New claim 21 has been added in this response.

Interview Summary

Applicants gratefully acknowledge the courtesy of Examiner Sheehan in granting a telephone interview with the undersigned on November 2, 2007. During the interview, the undersigned explained that by specifying the minimum distance between soft magnetic phases is greater than or equal to 0.1 μm , the present claims require the minimum size of the hard magnetic phase to be 0.1 μm . Arai et al., however, teach that the size of the hard magnetic phase is .0005 to .05 μm . The Examples in the specification and unexpected results were also discussed. Examples 1 to 3, in which the soft magnetic phases had the claimed size and spacing, had a JS value of about 1.8, which indicated anisotropy, while Comparative Example 1 had a JS value of 1.2 which indicated isotropy. A new dependent claim was also discussed. The Examiner indicated that the arguments would be given further consideration upon the filing of a written response.

Claim Rejections Under 35 U.S.C. § 102/103

Claims 1, 3, 4, 6-11, and 20 were rejected under 35 U.S.C. § 102(e) as anticipated by, or in the alternative, under 35 U.S.C. § 103(a) as obvious over Arai et al. (US Pat. No. 6,558,482). This rejection is traversed, and reconsideration and withdrawal thereof respectfully requested. The following is a comparison between the invention, as claimed, and the cited prior.

An aspect of the invention, per claim 1, is Nd-Fe-B type rare earth magnet alloy for a Nd-Fe-B type anisotropic exchange spring magnet comprising hard magnetic phases and soft magnetic phases. A minimum width of the soft magnetic phases is smaller than or equal to 1 μm ; a minimum distance between the soft magnetic phases is greater than or equal to 0.1 μm . A composition of the Nd-Fe-B type rare earth magnet alloy is expressed by the following chemical formula (1) $\text{Nd}_x\text{Fe}_{100-x-y-z}\text{B}_y\text{V}_z$ (1), where x is within a range from 9 to 11, y is within a range from 5 to 8 and z is within a range from 0 to 2. Chemical formula (1) optionally comprises Co, and if Co is present in the alloy 0.01 to 30 atom% of Fe is replaced with Co.

Another aspect of the invention, per claim 9, is a powder of a Nd-Fe-B type rare earth magnet alloy wherein a composition of the Nd-Fe-B type rare earth magnet alloy is expressed by the following chemical formula (1) $\text{Nd}_x\text{Fe}_{100-x-y-z}\text{B}_y\text{V}_z$ (1), where x is within a range from 9 to 11, y is within a range from 5 to 8 and z is within a range from 0 to 2. Chemical formula (1) optionally comprises Co, and if Co is present in the alloy 0.01 to 30 atom% of Fe is replaced with Co.

Another aspect of the invention, per claim 20, is a Nd-Fe-B type rare earth magnet alloy wherein a composition of the Nd-Fe-B type rare earth magnet alloy is expressed by the following chemical formula (1) $\text{Nd}_x\text{Fe}_{100-x-y-z}\text{B}_y\text{V}_z$ (1), where x is within a range from 9 to 11, y is within a

range from 5 to 8 and z is within a range from 0 to 2. Chemical formula (1) optionally comprises Co, and if Co is present in the alloy 0.01 to 30 atom% of Fe is replaced with Co.

The Examiner asserted that Arai et al. teach a Nd-Fe-B type rare earth magnet alloy having a soft magnetic phase and a hard magnetic phase. Arai et al. teach that the grain diameter of the hard and soft magnetic phases is 0.5 to 50 nm.

Arai et al. do not anticipate the claimed rare earth magnet alloy and powder because Arai et al. do not disclose a composition of the Nd-Fe-B type rare earth magnet alloy, comprising hard magnetic phases and soft magnetic phases, wherein a minimum width of the soft magnetic phases is smaller than or equal to 1 μm , and a minimum distance between the soft magnetic phases is greater than or equal to 0.1 μm , expressed by the following chemical formula (1) $\text{Nd}_x\text{Fe}_{100-x-y-z}\text{B}_y\text{V}_z$ (1), where x is within a range from 9 to 11, y is within a range from 5 to 8 and z is within a range from 0 to 2, wherein chemical formula (1) optionally comprises Co, and if Co is present in the alloy 0.01 to 30 atom% of Fe is replaced with Co, as required by claims 1, 9, and 20.

By specifying the minimum distance between soft magnetic phases is greater than or equal to 0.1 μm , the present claims require the minimum size of the hard magnetic phase to be 0.1 μm . Arai et al., however, teach that the size of the hard magnetic phase is .0005 to .05 μm .

The factual determination of lack of novelty under 35 U.S.C. § 102 requires the disclosure in a single reference of each element of a claimed invention. *Helifix Ltd. v. Blok-Lok Ltd.*, 208 F.3d 1339, 54 USPQ2d 1299 (Fed. Cir. 2000); *Electro Medical Systems S.A. v. Cooper Life Sciences, Inc.*, 34 F.3d 1048, 32 USPQ2d 1017 (Fed. Cir. 1994); *Hoover Group, Inc. v. Custom Metalcraft, Inc.*, 66 F.3d 399, 36 USPQ2d 1101 (Fed. Cir. 1995); *Minnesota Mining & Manufacturing Co. v. Johnson & Johnson Orthopaedics, Inc.*, 976 F.2d 1559, 24 USPQ2d 1321

(Fed. Cir. 1992); *Verdegaal Bros. v. Union Oil Co. of California*, 814 F.2d 628, 631, 2 USPQ2d 1051 (Fed. Cir. 1987). Because Arai et al. do not disclose a composition of the Nd-Fe-B type rare earth magnet alloy, wherein a minimum width of the soft magnetic phases is smaller than or equal to 1 μm , and a minimum distance between the soft magnetic phases is greater than or equal to 0.1 μm , expressed by the following chemical formula (1) $\text{Nd}_x\text{Fe}_{100-x-y-z}\text{B}_y\text{V}_z$ (1), where x is within a range from 9 to 11, y is within a range from 5 to 8 and z is within a range from 0 to 2, wherein chemical formula (1) optionally comprises Co, and if Co is present in the alloy 0.01 to 30 atom% of Fe is replaced with Co, as required by claims 1, 9, and 20, Arai et al. do not anticipate claims 1, 9, and 20.

Applicants further submit that Arai et al. do not suggest the claimed Nd-Fe-B type rare earth magnet alloys and powder of a Nd-Fe-B type rare earth magnet alloy.

Obviousness can be established by combining or modifying the teachings of the prior art to produce the claimed invention where there is some teaching, suggestion, or motivation to do so found either explicitly or implicitly in the references themselves or in the knowledge readily available to one of ordinary skill in the art. *In re Kotzab*, 217 F.3d 1365, 1370 55 USPQ2d 1313, 1317 (Fed. Cir. 2000); *In re Fine*, 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988); *In re Jones*, 958 F.2d 347, 21 USPQ2d 1941 (Fed. Cir. 1992). There is no suggestion in Arai et al. to modify Arai et al. to achieve a Nd-Fe-B type rare earth magnet alloy having a composition of the Nd-Fe-B type rare earth magnet alloy, wherein a minimum width of the soft magnetic phases is smaller than or equal to 1 μm , and a minimum distance between the soft magnetic phases is greater than or equal to 0.1 μm , expressed by the following chemical formula (1) $\text{Nd}_x\text{Fe}_{100-x-y-z}\text{B}_y\text{V}_z$ (1), where x is within a range from 9 to 11, y is within a range from 5 to 8 and z is within

a range from 0 to 2, wherein chemical formula (1) optionally comprises Co, and if Co is present in the alloy 0.01 to 30 atom% of Fe is replaced with Co, as required by claims 1, 9, and 20.

The present claims are further distinguishable over the cited prior art in view of the unexpected results obtained by the claimed alloy and powder. Examples 1 to 3, in which the soft magnetic phases had the claimed size and spacing, had a JS value of about 1.8, which indicated anisotropy, while Comparative Example 1 had a JS value of 1.2 which indicated isotropy. Arai et al. do not suggest the JS values obtained by the present invention and the claimed anisotropy.

The only teaching of a Nd-Fe-B type rare earth magnet alloy having a composition of the Nd-Fe-B type rare earth magnet alloy, wherein a minimum width of the soft magnetic phases is smaller than or equal to 1 μm , and a minimum distance between the soft magnetic phases is greater than or equal to 0.1 μm , expressed by the following chemical formula (1) $\text{Nd}_x\text{Fe}_{100-x-y-z}\text{B}_y\text{V}_z$ (1), where x is within a range from 9 to 11, y is within a range from 5 to 8 and z is within a range from 0 to 2, wherein chemical formula (1) optionally comprises Co, and if Co is present in the alloy 0.01 to 30 atom% of Fe is replaced with Co is found in Applicants' disclosure. However, the teaching or suggestion to make a claimed combination and the reasonable expectation of success must not be based on applicant's disclosure. *In re Vaeck*, 947 F.2d 488, 20 USPQ2d 1438 (Fed. Cir. 1991).

The dependent claims are allowable for at least the same reasons as the respective independent claims from which they depend and further distinguish the claimed Nd-Fe-B type rare earth magnet alloy and powder of a Nd-Fe-B type rare earth magnet alloy.

In light of the above Amendment and Remarks, this application should be allowed and the case passed to issue. If there are any questions regarding these remarks or the application in

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general, a telephone call to the undersigned would be appreciated to expedite prosecution of the application.

To the extent necessary, a petition for an extension of time under 37 C.F.R. § 1.136 is hereby made. Please charge any shortage in fees due in connection with the filing of this paper, including extension of time fees, to Deposit Account 500417 and please credit any excess fees to such deposit account.

Respectfully submitted,

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